REMARKS

By this Amendment, claims 1-8 are pending. Claims 1 and 7 are amended and new claim 8 is added. Reconsideration and allowance of the present application based on the following remarks is respectfully requested.

Claims 1-7 were rejected under 35. U.S.C §102(e) over Omi et al., JP 2000-040695. Applicants respectfully traverse this rejection because the effective filing date under §102 of the Omi et al. reference is after Applicant's priority date of November 25, 1999. Therefore, Omi et al. is not valid prior art. To perfect Applicant s' claim for priority, Applicants submit that an English translation of the certified priority documents was filed on October 4, 2001 (copy enclosed) .

Claims 1-5 and 7 were rejected under U.S.C §103(a) over Asamaki et al., U.S. Patent No. 4,950,956, in view of Okumura et al., U.S. Patent No. 6,297,165. This rejection is traversed because the re is no motivation or suggestion in Asamaki et al. or Okumura et al. to combine Asamaki et al. and Okumura et al. as suggested in the Office Action.

Independent claim 1 recites a plasma processing apparatus comprising, among other elements, an auxiliary electrode provided on an outer periphery of a first electrode to excite plasma in a vicinity of the auxiliary electrode and a magnetic field generator configured to apply a magnetic field to a surface of the substrate to which the plasma process is applied, wherein electrons in the plasma drift from a front surface of the auxiliary electrode to a back surface thereof and from the back surface of the auxiliary electrode to the front surface thereof. Similarly, independent claim 7 recites a plasma processing method comprising, among other elements, applying a magnetic field to a surface of the substrate to which the plasma process is applied, exciting plasma on at least a back surface of an auxiliary electrode provided on an outer periphery of a first electro de and causing electrons in the plasma to drift

from a front surface of the auxiliary electrode to the back surface thereof and from the back surface of the auxiliary electrode to the front surface thereof.

Although the Office Action recognizes that Asamaki et al. fails to teach or suggest a plasma processing apparatus having an auxiliary electrode, as recited in independent claim 1, and fails to teach or suggest exciting plasma on at least a back surface of an auxiliary electrode, as recited in claim 7, the Office Action asserts that Okumura et al. remedies this deficiency by teaching an auxiliary electrode provided on an outer periphery of a first electrode to excite plasma. The Office Action further speculates that one of ordinary skill in the art would have been motivated to combine the teachings of Asamaki et al. and Okumura et al. for accurately measuring self-bias potential and that the incorporation of the auxiliary electrode of Okumura et al. into the plasma processing apparatus of Asamaki et al. would inherently produce an apparatus capable of producing the claimed plasma electron drift.

Okumura et al. merely teach a ring-form voltage monitoring conductor 11 that is configured to monitor the self-bias potential generated in the substrate 8. The Okumura et al. patent is directed to etching and cleaning methods in which an end of an etching process or cleaning process is determined based on the self-bias potential of the substrate, which is monitored by the voltage monitoring conductor (See Fig. 1 and Col. 2, lines 1-26). Conductor 11 is driven the same way as substrate electrode 7 so as to recreate the self-biasing potential on conductor 11 that exists on substrate 8. Since the self-biasing potential on substrate 8 cannot be measured directly, measuring the self-biasing potential on conductor 11 is used as a proxy for the self-biasing potential on substrate 8 (Col. 2, lines 47 and Fig. 2 and its related description). Thus, conductor 11 is driven to replicate the self-biasing potential on substrate 8 not to create a particular flow of electrons around the conductor fails to teach. Absolutely no suggestion or motivation exists in Okumura et al. that by applying an

appropriate magnetic field, the electrons will drift as required by the claims. Okumura et al. do not teach or suggest producing a magnetic field capable of generating an EÿB drift, wherein the electrons are caused to drift parallel to the front and back surfaces of the auxiliary electrode.

Although Asamaki et al. teach the generation of a magnetic field, they fail to teach an auxiliary electrode to produce electrons that drift as claimed. In fact, the Asamaki patent is merely directed to increasing processing speed and throughput by forming plasma with a rotating magnetic field, which is intermittently pulsed. The cited patents teach bits and pieces of the claimed invention, but it would not be obvious to combine Asamaki et al. and Okumura et al. The claims of this application recite that the purpose of the invention is to produce electrons that drift across the front and back surfaces of the auxiliary electrode. This is accomplished by the claimed auxiliary electrode and the claimed magnetic field generator. Neither cited reference teaches a system that can produce the claimed electron drift. Asamaki et al. fail to teach or suggest that such a drift could be created by the addition of an auxiliary electrode as taught by Okumura et al. Okumura et al. fail to teach or suggest that the addition of a magnetic field generator, which produces a rotating magnetic field as taught by Asamaki et al., could produce the claimed electron drift.

Therefore, no motivation exists from these references to combine their teachings as suggested in the Office Action without impermissible hindsight. Therefore, the Office Action fails to present a *prima facie* case of obviousness.

Furthermore, Applicants have amended independent claims 1 and 7 to recite a static magnetic field, which differs from the rotating magnetic field of Asamaki et al. Thus, the claimed electron drift is produced by a static magnetic field and not a rotating magnetic field as taught by Asamaki et al.

Additionally, the Examiner admits that the combination of Asamaki et al. and Okumura et al. does not teach a front surface of the auxiliary electrode being covered by an insulating material, as recited in dependent claim 2. To make up for these deficiencies, the Examiner has taken Official Notice asserting that this feature is "admitted prior art". However, Applicants respectfully request that the Examiner provide a reference or references that show what the Examiner considers as "obviousness" in the Office Action (see p. 4) so that Applicants can assess the teachings of such references, if any, and determine whether they are combinable with Asamaki et al. and Okumura et al. See MPEP 2144.03.

Accordingly, reconsideration and withdrawal of rejection of claims 1-5 and 7 is respectfully requested.

Claim 6 was rejected under U.S.C §103(a) over Asamaki et al. in view of Okumura et al. and further in view of Shan, U.S. Patent No. 6,232,236. This rejection is traversed because Shan fails to provide any motivation to combine Asamaki et al. and Okumura et al. as discussed above with respect to independent claims 1 and 7.

Shan does not remedy the deficiencies of Asamaki et al. and Okumura et al. discussed above. Accordingly, withdrawal and reconsideration of the rejection of claim 6 is respectfully requested.

New claim 8 has been added to incorporate the subject matter of original claim 2 into original claim 1. No new matter has been introduced by the addition of this claim.

For at least the foregoing reasons, Applicants submit that the claims define patentable subject matter and that the entire application is in condition for allowance. Timely notice to that effect is therefore respectfully requested.

Attached is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned **"Version with markings to show changes made"**.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 1 and 7 as follows:

1. (Twice Amended) A plasma processing apparatus comprising:

a first electrode;

a substrate configured to be subjected to a plasma, the substrate being positioned on the first electrode;

a magnetic field generator configured to apply a static magnetic field to a surface of the substrate to which the plasma process is applied; and

an auxiliary electrode provided on an outer periphery of said first electrode to excite plasma in a vicinity of the auxiliary electrode,

wherein electrons in the plasma drift from a front surface of said auxiliary electrode to a back surface thereof and from the back surface of said auxiliary electrode to the front surface thereof.

7. (Twice Amended) A plasma processing method performed in a plasma processing apparatus comprising a first electrode on which a substrate on which a substrate is positioned and an auxiliary electrode provided on an outer periphery of said first electrode, the method comprising:

subjecting the substrate to a plasma process containing a plasma;

applying a static magnetic field to a surface of the substrate to which the plasma process is applied;

exciting plasma on at least a back surface of the auxiliary electrode; and

causing electrons in the plasma to drift from a front surface of said auxiliary electrode to the back surface thereof and from the back surface of said auxiliary electrode to the front surface thereof.

New claim 8 is added.

End of Appendix